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DP MANAGEMENTS EXPERIENCE WITH ADR/IDEAL.

A SURVEY OF ACTIVE CORPORATE USERS OF THE ADR/IDEAL® FOURTH GENERATION APPLICATION DEVELOPMENT SYSTEM.

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CORPORATE DP MANAGEMENT EXPERIENCE WITH ADR/IDEAL

A SURVEY OF ACTIVE USERS OF THE ADR/IDEAL FOURTH GENERATION APPLICATION DEVELOPMENT SYSTEM

NOVEMBER 1985

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CORPORATE DP MANAGEMENT EXPERIENCE WITH ADR/IDEAL

CONTENTS

Page

INTRODUCTION 1

PURPOSE OF REPORT 2

METHODOLOGY 4

EXECUTIVE SUMMARY & OVERVIEW 7

IDEAL USER CHARACTERISTICS 11

REASONS FOR CHOOSING A FOURTH GENERATION LANGUAGE 19

REASONS FOR CHOOSING ADR/IDEAL 25

IDEAL APPLICATIONS 28

HIGH VOLUME APPLICATIONS 30

IDEAL ATTRIBUTES 35

STRENGTHS & WEAKNESSES OF IDEAL 39

IDEAL & OTHER LANGUAGES 48

INCREASE IN PRODUCTIVITY 54

RESPONDENT FREE-FORM COMMENTS 56

APPENDIX A - FOURTH GENERATION LANGUAGE QUESTIONNAIRE 59

APPENDIX B - LIST OF ORGANIZATIONS INTERVIEWED . 71

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CORPORATE DP MANAGEMENT EXPERIENCE WITH ADR/IDEAL

EXHIBITS

Page

I FAMILIARITY WITH SELECTED SOFTWARE 15

II OVERALL SATISFACTION WITH IDEAL 18

III FACTORS IN FGL CHOICE 20

IV OTHER FACTORS IN OBTAINING A FOURTH GENERATION LANGUAGE 23

V REASONS FOR SELECTING IDEAL AS FGL OF CHOICE 26

VI IDEAL LARGE APPLICATION CLASSIFICATION 31

VII PRODUCT CHARACTERISTIC RATINGS 36

VIII IDEAL'S GREATEST STRENGTHS 40

IX IDEAL'S WEAKNESSES 43

X REASONS FOR LIKELIHOOD OF RECOMMENDATIONS 46

XI REPLACE COBOL OR PL1 IN THE MAJORITY OF BACKLOG 49

XII BACKLOG SUITABLE FOR IDEAL 52

XIII FREE-FORM COMMENTS 58

INTRODUCTION

- This report and the survey on which it is based were commissioned by Applied Data Research, Inc., Princeton, New Jersey in October 1985.

- INPUT was chosen to perform this study as a result of its experience in providing research and planning services to the information services industry for more than a decade.

PURPOSE OF REPORT

- This study was commissioned to provide ADR management and other interested parties with an objective view of user attitudes, perceptions, satisfaction levels and other matters related to a specific systems software product offering. That offering is ADR/IDEAL, a Fourth Generation Applications Development System introduced by ADR in 1983.

- Specific topics covered include:
    - Reasons for adopting a Fourth Generation Language for applications development.
    - Familiarity with various Fourth Generation Languages.
    - Length of experience with IDEAL product.
    - Primary reasons for the selection of IDEAL.
    - Number of applications implemented with IDEAL.
    - Number of applications planned for IDEAL.
    - Types of applications.
    - High volumes applications.
    - Proportion of total applications/programs which can be written in IDEAL.

PURPOSE OF REPORT - (cont'd)

- Specific user satisfaction topics covered for IDEAL include:
  - User ratings of specific capabilities including:
    - Range of productivity increases, if any.
    - High volume performance.
    - General satisfaction.
    - Likelihood of recommendation to third parties.

METHODOLOGY

- Methodology was generally consistent with that employed by INPUT in its own studies and those commissioned by other firms interested in product assessment.

- Information was gathered by a structured telephone interview.

- As a first step, topics for the survey were jointly developed by ADR management and INPUT. A questionnaire was then designed by INPUT to elicit a maximum amount of quantitative and qualitative information in a minimum amount of time.

- The questionnaire was pre-tested on a small group of IDEAL users to verify that questions were being properly interpreted. As a result of this pre-test, minor modifications and additions were made to the questionnaire.

- A combination of structured and open-ended questions was employed.

- ADR provided a list of approximately 200 IDEAL users. These users were notified by ADR that they might be contacted to participate in the study and were encouraged to cooperate in the study. To ensure maximum objectivity, respondents were guaranteed that their identities would not be revealed to ADR.

- Primary interview work was conducted in late October and early November with INPUT Research Analysts acquiring 80 interviews during this period from North American respondents.

- No stratification techniques were employed and a wide range of industries and organizational sizes was included in the sample.

- Typical interview duration was approximately twenty (20) minutes.

- After completion of data acquisition, INPUT employed conventional analytical techniques in the production of this report.

- The questionnaire employed is reproduced in totality in Appendix A.

- A list of firms participating in this study is included as Appendix B.

EXECUTIVE SUMMARY & OVERVIEW

- The ADR/IDEAL Fourth Generation Applications Development System enjoys an excellent reputation among users participating in this study.

- IDEAL applications are extensive and diverse, averaging 12.3 implemented applications per organization interviewed and an additional 11.3 planned.

- Respondents rate IDEAL highly with a mean satisfaction rating of 4.0 on a scale of one to five. Responses were skewed towards the high end of the range with a complete absence of "not satisfied" responses. In INPUT's experience this is an unusually strong degree of product satisfaction.

- Respondents were asked to rate their satisfaction with IDEAL's overall performance in high-volume applications. The mean rating was 3.7. At the 90% confidence interval there is no statistically significant difference between IDEAL's rating on high volume satisfaction and overall satisfaction which was 4.0.

- This satisfaction performance is even more remarkable in the context of the benefits sought when purchasing IDEAL. Respondents wanted increased productivity, reduced maintenance, the ability to build applications quickly and ease of use in the Fourth Generation Language of choice.

- IDEAL's high overall satisfaction rating indicates that the desired benefits are present in the product, i.e. there is a strong relationship between benefits sought and obtained.

- Of particular note are the productivity increases found over COBOL. On average the productivity increase experienced was 4.4:1 with 40% of respondents indicating gains in excess of 5:1.

- Further corroborative evidence of IDEAL's performance was found in ratings of specific product attributes such as ease of programming, training requirements, prototyping effectiveness and cost effectiveness. IDEAL received high marks ranging from 4.1 to 3.8 in each of these categories.

- A remarkable 97.5% of respondents stated IDEAL was easy to very easy to program while 91% considered the product as cost-effective to very cost-effective in their applications.

- In unprompted comments on IDEAL's greatest strengths, ease of use, greater productivity and ease of learning the product were mentioned with the highest frequency.

- Continuing the dominant theme in this study of high satisfaction with IDEAL, it is noteworthy that more than eight out of ten respondents stated it was "very likely" that they would recommend IDEAL to another DP professional. No respondent thought recommendation unlikely.

- While users are extremely positive in their view of IDEAL, they recognize that the current version has limitations on its use in batch applications. Further, some users note needs for improvements in product support information while others perceive that use of machine resources can be heavy.

- Almost three out of four respondents (73.8%) indicated that ADR/IDEAL could replace COBOL for the majority of their applications backlog. The average percentage of applications replaceable by IDEAL was 70.0% of the total backlog for all respondents. Over half the respondents indicated that 80% or more of their backlog could be implemented in IDEAL.

- Based on INPUT's experience in the assessment of software and systems, we would characterize ADR/IDEAL as an outstanding product, one which is exemplary in many respects. While respondents note a few areas of less than optimum strength, these indicate a realistic view of IDEAL on the part of users who have sufficient experience and offer constructive suggestions for improvement of a product which they rate highly in the aggregate. On virtually all dimensions tested in this study ADR/IDEAL exhibits good to excellent performance and a high level of user satisfaction.

IDEAL USER CHARACTERISTICS

- Respondents covered a representative range of titles within the cooperating organizations. Eleven percent (11%) were Vice Presidents of MIS, 12% Directors, 46% Managers (usually of DP or Software Development), 21% were Data Base Administrators, while 10% were Technical Personnel, typically Systems Analysts or Programmers.

- The mean length of time for their involvement with ADR/IDEAL was 14 months while the maximum was 30 months and the minimum was two months. Only 7.5% of respondents had less than six months of personal experience with IDEAL. 68.8% of respondents had at least one year of experience with the software.

- The persons interviewed had a total of 1,115 months involvement with IDEAL, the equivalent of 93 man-years of experience. In the opinion of INPUT this is an adequate base of experience on which to form views of the product as presented herein.

- Respondents were also queried as to the amount of time IDEAL had been in use at their location. The mean for this value was slightly shorter at 13 months. Again, the minimum was two months and the maximum was 30 months. 8.75% had less than six months experience at their location with the product.

- On a location basis, there was a total of 1,055 months of experience with IDEAL, the equivalent of 88 man-years.

- We may conclude that we are confident at the 90% level that the true mean for IDEAL experience in the sample falls between 12 and 15 months.

- The moderate tendency for individual experience to exceed location experience is accounted for by the fact that 90% of respondents were involved in the decision to acquire and install IDEAL at their location. Their personal experience with the package is naturally somewhat longer than the site experience.

- In addition to the length of their personal involvement with IDEAL and the length of time the software had been used at their site, respondents were also asked to assess their familiarity with the system.

- R's were asked to rate their familiarity with IDEAL on a scale of one to five with one (1) being unfamiliar and five (5) being very familiar. The mean rating for all respondents on this scale was 3.9. The 90% confidence range is between 3.7 and 4.1.

- Only one respondent indicated he was unfamiliar with the package. 90% of respondent ratings ranged from familiar to very familiar. This clustered distribution of responses causes INPUT to conclude that respondents are knowledgeable in the characteristics of IDEAL based on direct experience.

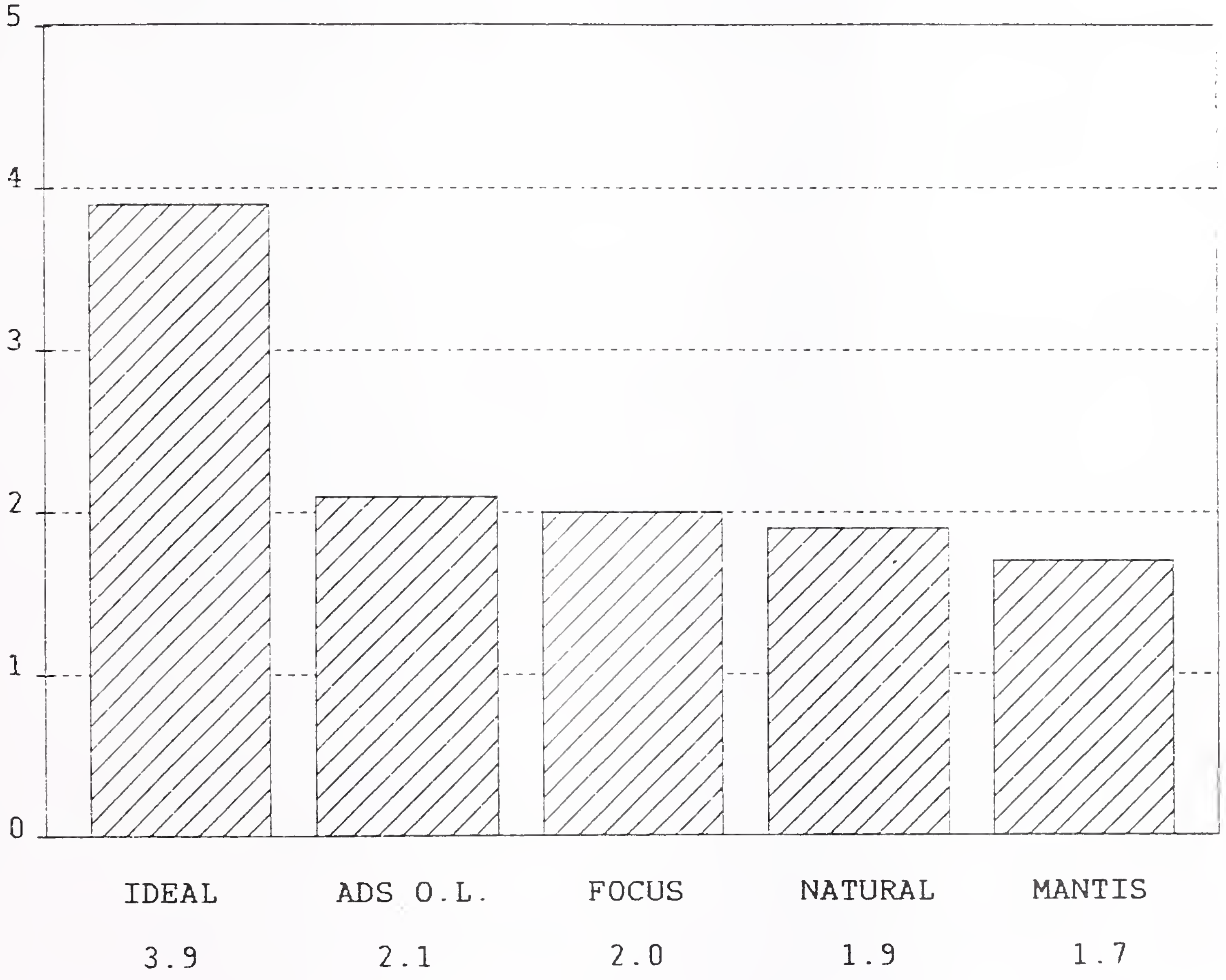
- Respondents were also queried on their familiarity with selected potentially competitive software offerings. The offerings tested were:
  - Software AG's Natural.
  - Cincom's Mantis.
  - Cullinet's ADS OnLine.
  - Information Builder's Focus.

- Exhibit I shows the relative familiarity ratings. As would be expected, there is a statistically significant difference between familiarity with the IDEAL which is installed at all sites surveyed and the other software which is probably not installed in most cases. The differences in familiarity between competing packages is not statistically significant at the 90% confidence level. This data implies that respondents are calibrating their assessments of IDEAL against their operational needs as contrasted to a "theoretical" comparison to other packages based on the specifications of the packages.

EXHIBIT I

FAMILIARITY WITH SELECTED SOFTWARE

AMONG ADR/IDEAL USERS



N=80

- This implication is supported by a review of the proportion of respondents claiming unfamiliarity (rating = 1) with other packages. These proportions are:

  Mantis = 56%
  Focus = 40%
  Natural = 39%
  ADS On-Line = 38%

  As this data shows, a substantial proportion of R's are unfamiliar with this software. On this basis, the assessment of IDEAL must necessarily be driven by actual operational experience.

- On the basis of experience with IDEAL, respondent general satisfaction with the product may be characterized as high. Respondents were asked to rate overall satisfaction on a scale of one to five. One (1) was described as not satisfactory while five (5) was designated as very satisfactory.

- The mean rating was 4.0 with the 90% confidence range falling at 3.9 and 4.1 respectively for low and high. This is a highly satisfactory rating for a product.

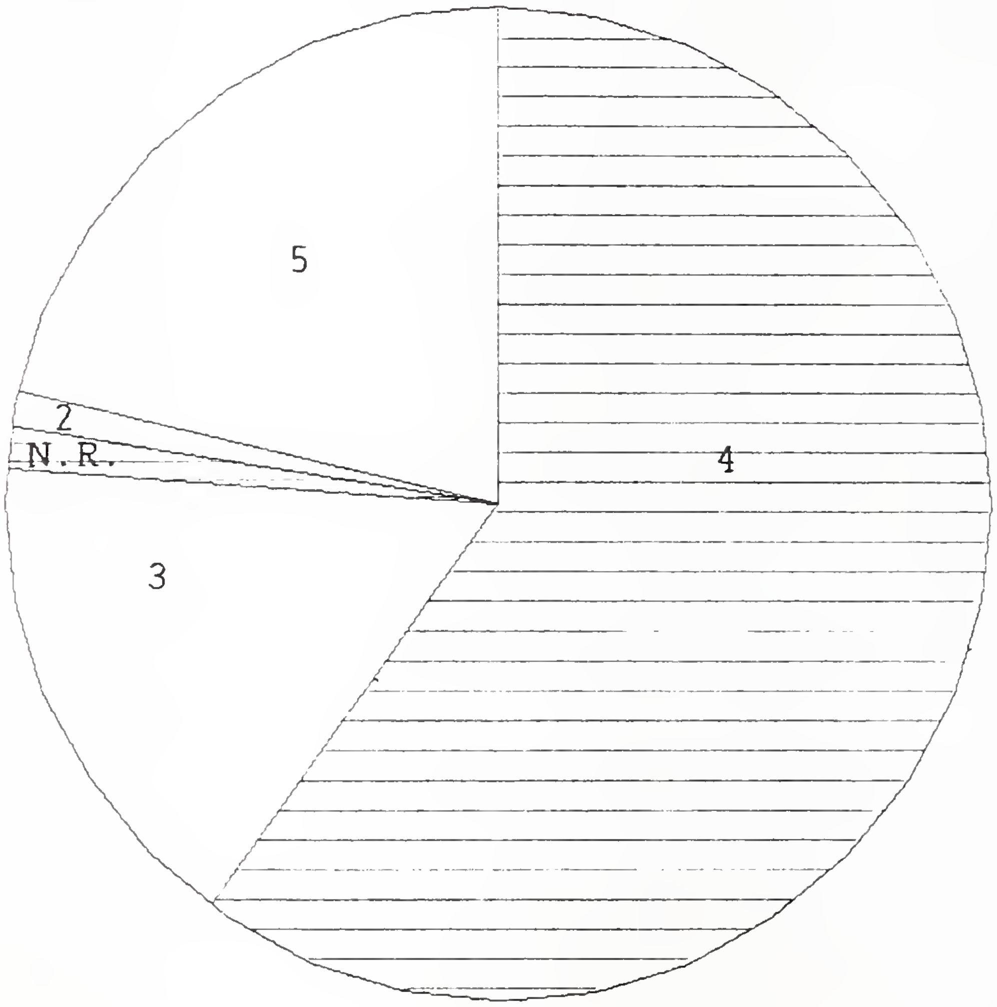
- Perhaps even more importantly, the distribution of overall satisfaction ratings was heavily skewed toward the upper end of the scale. The distribution of respondent ratings is presented as Exhibit II.

- Both the mean overall satisfaction rating and the rating distribution indicate that users of IDEAL in this sample are highly satisfied with their choice of an applications development system.

EXHIBIT II

OVERALL SATISFACTION WITH IDEAL

RESPONDENT RATING DISTRIBUTION



N=80=100%

Rating 5 = 21.25%
Rating 4 = 60.00%
Rating 3 = 16.25%
Rating 2 = 1.25%
Rating 1 = 0.00%
No Rating= 1.25%

REASONS FOR CHOOSING A FOURTH GENERATION LANGUAGE

- Respondents were queried as to their reasons for obtaining a Fourth Generation Language in general and for their choice of IDEAL in the specific case. These queries were conducted in both a structured and open-ended form.

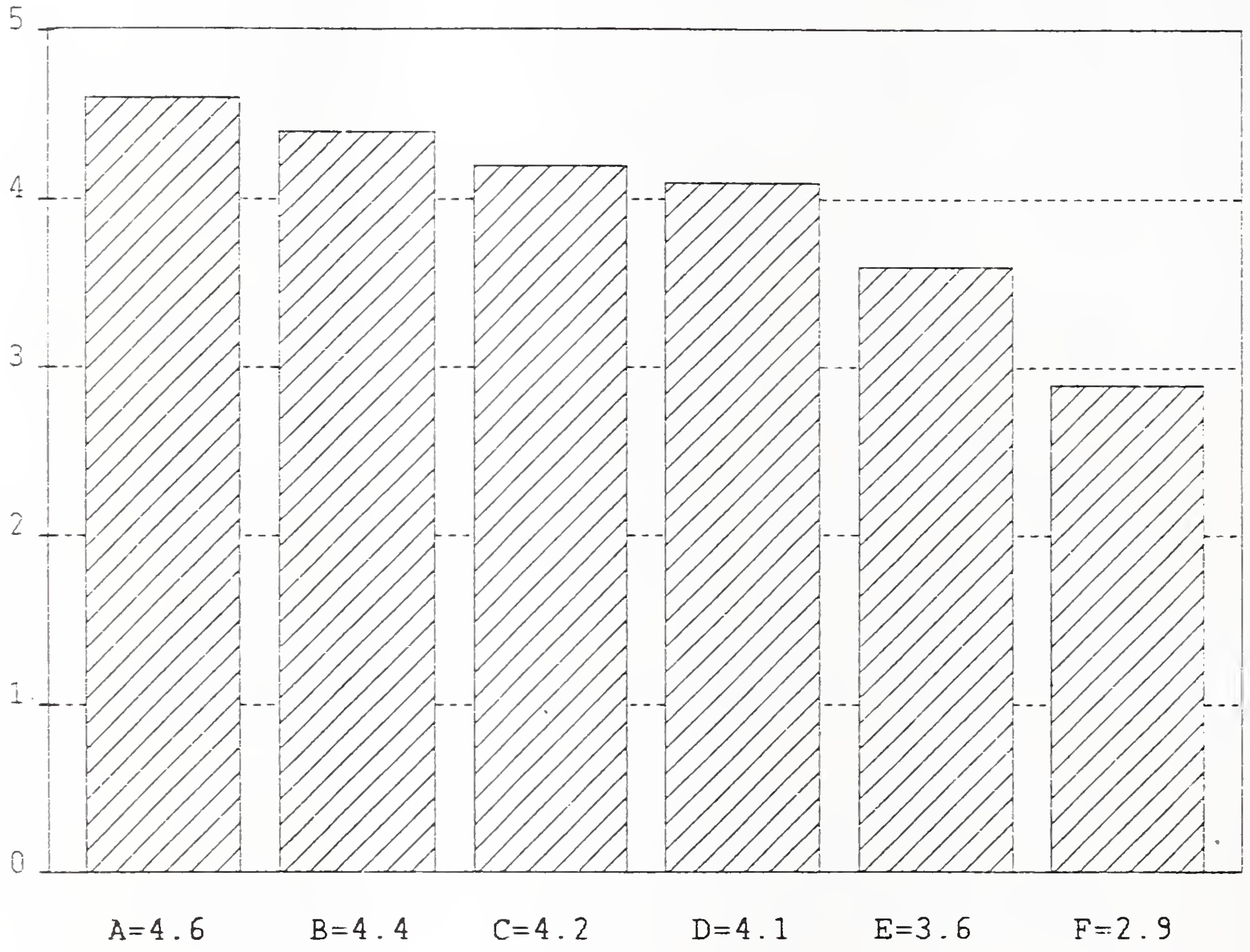
- Respondents were asked to rate the importance of a fixed set of six factors in their decision to obtain a Fourth Generation Language. Once again a one to five scale was employed with one (1) as unimportant and five (5) as very important. Exhibit III presents these factors in rank order.

- The difference between Factor A "Increased Productivity" and Factor B "Reduced Maintenance" is not statistically significant. Factor C, "Build Applications Quickly" is statistically less important than Factor A, but not Factor B. Factor D, "Ease Of Use" is less important (statistically significant) than Factors A and B but not Factor C. Factor E, "Backlog Reduction" is significantly less important than the four preceding factors. Factor F, "Pressing Deadline" is significantly less important than all other factors.

EXHIBIT III

FACTORS IN FGL CHOICE

STRUCTURED, RANK ORDER



A is increased productivity.

B is reduced maintenance on applications.

C is the ability to build applications quickly.

D is ease of use.

E is reduce your company's applications backlog.

F is to complete a specific major project with a pressing deadline.

REASONS FOR CHOOSING A FOURTH GENERATION LANGUAGE - (cont'd)

- As a practical matter, the first four factors can be considered as being of more than moderate importance to respondents.

- Respondents sought increased productivity, reduced maintenance, the ability to build applications quickly and ease of use as a "cluster" of characteristics in their decision to obtain a Fourth Generation Language.

- Of significantly less importance was the ability to reduce the company's backlog, and of significantly less importance than backlog reduction was the need to complete a specific project with a deadline.

- In reviewing these "motivating" factors it is important to note that no factor was considered unimportant, i.e. received a low mean rating. For example, about 21% of respondents indicated that the lowest ranking factor "specific project" was very important (5) in their decision to acquire a Fourth Generation Language for applications development.

REASONS FOR CHOOSING A FOURTH GENERATION LANGUAGE - (cont'd)

- In addition to the structured factors, respondents were probed as to the existence of any additional factors motivating their election of a Fourth Generation Language. A total of 56 additional responses were obtained from 44 (55%) of the respondents for an average of 1.3 additional factors for those citing additional factors.

- Content analysis of these factors revealed similarities in 66% of the additional factors cited while 33% were unique to individual situations.

- The most common "additional" factors are presented as Exhibit IV.

- Observe that while these factors - even the most popular - are minority positions, they can be extremely important factors in the decision to acquire a Fourth Generation Language.

EXHIBIT IV

OTHER FACTORS IN OBTAINING A FOURTH GENERATION LANGUAGE

	PROPORTION	RATING
PREVIOUSLY INSTALLED ADR RELATIONAL DB	26%	4.8
LONG TERM REDUCTION IN TRAINING TIME/COST	19%	4.2
COULD INTERFACE WITH ACTIVE DICTIONARY	16%	4.5
SINGLE VENDOR CONCEPT	13%	4.8
WANTED PROTOTYPING CAPABILITY	8%	5.0
CICS COMPLEXITY	8%	4.5
STANDARDIZE ON SINGLE LANGUAGE	5%	5.0
REDUCE DP STAFF	5%	4.0
	100% TOTAL	4.6 GRAND MEAN

NOTE: COVERS FACTORS MENTIONED MORE THAN ONCE, SINGLE MENTIONS ARE EXCLUDED. N = 44.

REASONS FOR CHOOSING A FOURTH GENERATION LANGUAGE - (cont'd)

- The grand mean for the group of additional factors is as high as for the highest structured factor (increased productivity) and individual factors such as a desire for prototyping capability or language standardization can be extremely powerful motivators.

- In observing the variety and strength of motivating factors it is notable that ADR/IDEAL achieves a high overall satisfaction rating (as shown earlier) in the context of diverse acquisition motivations.

REASONS FOR CHOOSING ADR/IDEAL

- With respect to the choice of ADR/IDEAL versus other Fourth Generation Languages, the 80 respondents set forth a total of 107 reasons for the selection of IDEAL over other packages for a mean of 1.3 reasons per respondent.

- In general, the reasons for selecting IDEAL were more cohesive than the factors involved in the general selection of a Fourth Generation Language. Of the 107, only 7.5% constituted single mentions.

- A summary of reasons for selecting IDEAL is presented as Exhibit V.

- As the exhibit makes clear, IDEAL decisions are made in a context, not as a "stand-alone" decision. Well over half (59%) of reasons given relate to other software in the product line, most frequently the association with the relational database.

EXHIBIT V

REASONS FOR SELECTING IDEAL AS FGL OF CHOICE

REASON	PROPORTION
ASSOCIATED WITH RELATIONAL DB	39%
PART OF INTEGRATED PRODUCT SET	20%
EASE OF USE	9%
DATA DICTIONARY FEATURE	7%
HIGH PERFORMANCE	7%
IMPROVED PRODUCTIVITY	6%
TO REPLACE COBOL	4%
ADR SUPPORT	3%
LOW LEARNING TIME	3%
FLEXIBILITY	2%
	100%

NOTE: BASE IS 99 MULTIPLE MENTIONS.

REASONS FOR CHOOSING ADR/IDEAL - (cont'd)

- Specific product features/capabilities comprise 23% of the mentions. Apparently those selecting IDEAL satisfy themselves that the product provides the "generic" Fourth Generation Language benefits they seek and position that determination in a larger "systems" context.

- This data demonstrates the complexity of the decision process and the importance of related software in that process.

IDEAL APPLICATIONS

- Respondents were probed as to the number of IDEAL applications implemented, number planned and other applications specifics. This section deals with these aspects.

- The mean number of applications implemented per respondent (neglecting one outlier claiming 900 applications implemented) was 12.3. Range was from zero to 300. In context of the mean site installation duration of 13 months and the scale of some applications found, this seems to imply a very impressive implementation rate.

- The average time with IDEAL installed for those with zero applications implemented was three months. This group accounted for only 4.2% of organizations interviewed. Satisfaction scores for new users were the same as for the group as a whole.

- The mean number of applications planned (but not implemented) was 11.3, again neglecting one outlier with 200 applications planned. The range of applications planned was from zero to 100.

IDEAL APPLICATIONS - (cont'd)

- It is important to note that there is no relationship between a lack of planned applications and satisfaction with IDEAL. There was no meaningful difference in satisfaction ratings between the 2.8% with no applications planned and the sample as a whole. This tiny group did, however, have a longer than average installation time by about 40%.

HIGH VOLUME APPLICATIONS

- Each study participant was asked to name and briefly describe one or two of the organization's large volume applications.

- This protocol yielded a list of 119 applications designated as large. A content analysis was undertaken which reduced the group to 17 multiple mention categories covering 88 applications. Additionally, 31 applications were not classifiable into the main scheme.

- Multiple mention applications are set forth in Exhibit VI. Note that the top three applications account for 46.6% of classifiables and 34.7% of all large volume applications.

- This list shows the diversity of uses to which IDEAL has been put in a relatively short period of time, i.e. since its release in 1983.

EXHIBIT VI

IDEAL LARGE APPLICATION CLASSIFICATION

TYPE	% OF TOTAL MULTIPLE RESPONDENTS	
ACCOUNTING	18.2	
INVENTORY	17.0	
HUMAN RESOURCES	11.4	(46.6%)
ORDER ENTRY	6.9	
INSURANCE RELATED	5.7	
BANKING	5.7	
PURCHASING	4.5	
SALES & MARKETING	4.5	
CUSTOMER DATABASE	4.5	
SEWER & WATER	4.5	
MANAGEMENT REPORTING	3.4	
PROJECT TRACKING	3.4	
STUDENT REGISTRATION	3.4	
MAILING LISTS	2.3	
TAX	2.3	
TEST PROCESSING	2.3	
	100.0%	

- Single mentions show an even wider range of applications and include:
  - Legal Docket System
  - Bridal Registry
  - Census
  - Franchise Analysis
  - Microfilm Index
  - Terrain Study File
  - Hospital Records

  Plus 24 other diverse applications.

- The wide range of applications found tends to support the view of many users that IDEAL can be used to implement most types of applications.

- Approximately two thirds of respondents indicated that there were additional high volume applications beyond those specifically listed by name. Of those indicating the existence of additional applications, about one third were able to estimate the number of such applications. The mean number of high volume applications at these sites was 7.2 compared to the mean number of total applications implemented which was 13. This indicates that at many sites the majority of applications are considered high volume by respondents.

- All ratings on high volume performance satisfaction clustered between three and five on a five point scale. Forty five percent of those responding rated IDEAL as a three on high volume, 40% a four and 15% a five. No respondent rated IDEAL high volume performance as unsatisfactory, i.e. a one or two rating.

- In examining the available volume data and comparing it to satisfactory ratings, no relationship between stated high volume application volume and satisfaction was found. For example, one respondent stated his daily transaction rate constituting high volume was 1,000,000 and rated IDEAL a five on high volume performance. Another claimed 500 transactions/day as high volume and rated IDEAL's high volume performance as a three.

- INPUT concludes that high volume performance is on average more than satisfactory to respondents and that the limited variations present are most likely due to factors external to the IDEAL product and are not related directly to application volumes.

IDEAL ATTRIBUTES

- Survey participants were asked to rate ADR/IDEAL's performance in several categories. These were:
    - Ease of programming.
    - Training requirements.
    - Prototyping effectiveness.
    - Cost effectiveness.

- The results of these product characteristics ratings are presented as Exhibit VII.

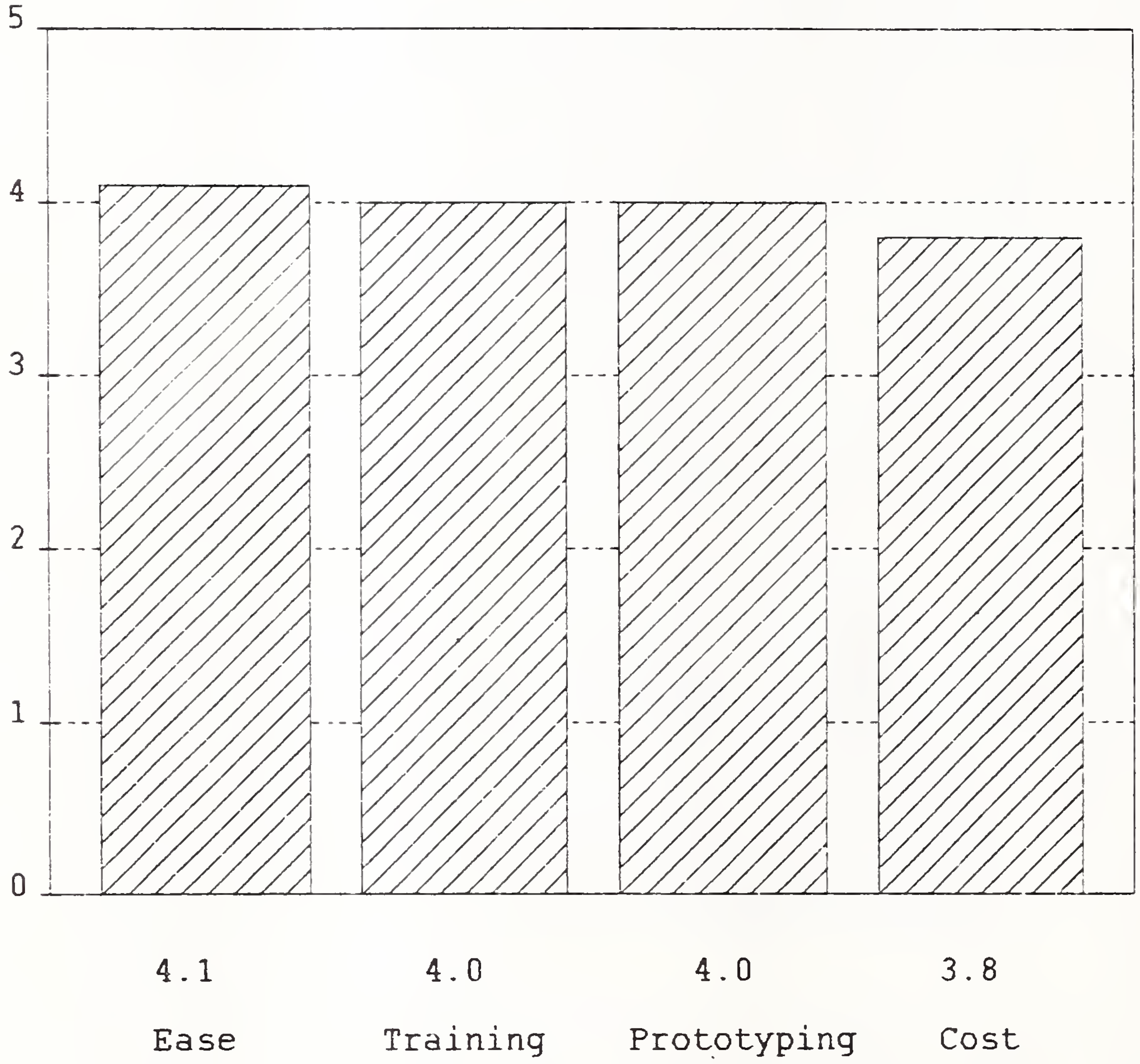
- IDEAL receives high marks in all four performance categories. While the data are presented in rank order, there is no statistically significant difference between the rating at the 90% confidence level.

- Only one respondent rated IDEAL as being very hard to program. No respondents categorized training as very hard.

- 97.5% of respondents stated that IDEAL was easy to very easy to program. 97.5% also categorized training as easy to very easy.

EXHIBIT VII

PRODUCT CHARACTERISTIC RATINGS



N=79

- Similar responses were obtained on the two effectiveness dimensions. No respondents considered IDEAL to be ineffective for prototyping or cost ineffective.

- 86% of those surveyed classified IDEAL as effective to very effective for prototyping. 91% rated IDEAL as cost-effective to very cost effective in their applications.

- In INPUT's experience these are excellent ratings notable not only for their relatively high means but also for the almost total absence of dissatisfaction on the dimensions tested.

- Additionally, respondents were asked if any other important attributes of IDEAL were omitted. 71% could think of no important omitted attribute while 29% suggested another attribute.

IDEAL ATTRIBUTES - (cont'd)

- These were diffuse in nature with only very limited multiple mentions. Receiving multiple mentions were:

Additional Attributes	% Mentioning
Integration with database dictionary	4
Integration with other software	3
Batch characteristics	3
Speed	3

- While the number of multiple responses is very small, respondents mentioning integration were very positive while those mentioning batch characteristics and speed were moderately negative regarding these attributes.

STRENGTHS & WEAKNESSES OF IDEAL

- Survey participants were asked in an open-ended and unprompted form what they believed were IDEAL's greatest strengths. 145 statements were obtained for an average of 1.8 greatest strengths per respondent. Of these 145, 140 or 96.6% were multiple mentions. They are summarized as Exhibit VIII.

- Note that about 60% of strength responses cluster around general benefits mentioning ease of some type or are related to implementation speed/productivity. These are general benefits.

EXHIBIT VIII

IDEAL'S GREATEST STRENGTHS

STRENGTH	% OF TOTAL
EASY TO USE	17.1
GREATER PRODUCTIVITY	11.4
EASY TO LEARN	11.4
EASY DEVELOPMENT/WRITING	8.6
DB DICTIONARY INTEGRATION	7.1
IMMEDIATE RESULTS	6.4
PROTOTYPING ABILITY	5.0
STANDARDIZED CODING STRUCTURE	5.0
LANGUAGE NATURE	5.0
PORTABILITY	2.9
SCREEN PAINTING	2.9
PANEL DEFINITION	2.9
VENDOR SUPPORT	2.1
COMPLETE APPLICATIONS ENVIRONMENT	2.1
OTHER (LESS THAN 1% EACH)	10.1
	100.0%

NET RESPONSES (NO SINGLE MENTIONS) = 140

N=80

- Further observe that about 40% of benefits are largely technical characteristics of the product. Many respondents mentioned both general and technical strengths but there is less uniformity by far among the technical strengths cited.

- INPUT believes that there is considerable agreement about the general strengths of IDEAL, i.e. the "effects" of employing the product for applications development. As to the technical causes of the various "ease" strengths, there is substantially greater diversity of opinion.

- The high degree of correspondence between claims by the vendor for the product and the experience of users as evidenced by their responses to this strength query is notable.

- In addition to strengths, 66 respondents were queried as to product weakness. This question was added to the form after the first 14 (17.5%) interviews were completed. Among those questioned an average of 1.4 weakness per respondent were found. Of these 8.5% were single mentions. Weakness responses are summarized as Exhibit IX.

EXHIBIT IX

IDEAL'S WEAKNESSES

WEAKNESS	% OF TOTAL
BATCH PERFORMANCE	20.9
PRODUCT SUPPORT INFORMATION	16.3
HEAVY USE OF COMPUTER RESOURCES	14.0
SLOW PERFORMANCE	10.5
NEW SYSTEM	9.3
SLOW REPORTING	7.0
SYSTEM SECURITY	4.7
PROTOTYPING RELATED	3.5
OTHER (LESS THAN 2.5% EACH)	13.8
	100.0%

NET RESPONSES (NO SINGLE MENTIONS) = 86

N = 66

STRENGTHS & WEAKNESSES OF IDEAL - (cont'd)

- Observe that there is a general lack of continuity in these responses. Unlike strengths, there is some tendency to cite slow performance in various manifestations, but in general weaknesses are less coherent than strengths.

- Minor weakness mentions were primarily of a strongly technical nature.

- Note that both strengths & weaknesses are of a general qualitative and evaluative nature. They should be considered in light of the overall satisfaction rating of 4.0 by these same respondents.

- To further calibrate user evaluation of IDEAL, respondents were asked if they would recommend ADR/IDEAL to another data processing professional. No respondent thought it unlikely that they would recommend IDEAL. 82.5% of respondents stated that it was very likely they would recommend the product while 16.25% thought it was somewhat likely. Only one respondent did not know the answer to this question. Please see Exhibit X.

- Exhibit X summarizes the reasons given for those very likely to recommend (82.5%) and those somewhat likely to recommend.

EXHIBIT X

REASONS FOR LIKELIHOOD OF RECOMMENDATION

(MULTIPLE MENTIONS)

VERY LIKELY TO RECOMMEND

REASON	% OF TOTAL
HAS DONE ALL CLAIMED, HAVE HAD GOOD EXPERIENCE	48.5
PRODUCTIVITY GAINS	22.7
EASY TO USE	18.2
MORE SHOPS SHOULD KNOW IDEAL	9.1
LEARNING CURVE SHORT	7.6
GOOD ADR REPUTATION	7.6
INTEGRATED RELATIONAL DATABASE	6.1
NOT GOOD FOR BATCH	6.1

N = 66

SOMEWHAT LIKELY TO RECOMMEND

REASON	% OF TOTAL
DEPENDS ON APPLICATION	46.2
SUPPORT DIFFICULTIES	23.1
LIMITED EXPERIENCE	15.4

N = 13

NOTE: TOTALS DO NOT ADD TO 100% DUE TO MULTIPLE MENTIONS.

- Based on its experience in product assessment INPUT believes that the likelihood of recommendation proportions achieved by ADR/IDEAL represent an unusually high willingness to recommend.

- This willingness to recommend is not simply a blind enthusiasm but is based on operational experience and an understanding that software exists in an applications context. This is evidenced by the recognition of application dependency among those somewhat likely to recommend and the batch processing comments of a few very likely recommenders.

- Most notable in the recommendation context is the total absence of respondents classifying themselves as unlikely to recommend IDEAL to another data processing professional.

IDEAL & OTHER LANGUAGES

- A key aspect of the research was to determine the proportion of applications which respondents believe can be written in IDEAL and IDEAL's ability to replace procedural languages such as COBOL or PL1. This section presents these findings.

- Respondents indicated in 73.8% of organizations polled that IDEAL could replace COBOL or PL1 for the majority of programs in their backlog. Of the balance 21.2% indicated IDEAL could not substitute for COBOL or PL1 in the majority of their backlogged applications. Five percent were not sure.

- Expressed another way, almost three out of four stated that, based on their experience, ADR/IDEAL was a replacement for the majority of their backlogged applications.

- Respondents were interrogated as to the reasons for this estimate in an open-ended form. Responses are summarized as Exhibit XI.

EXHIBIT XI

REPLACE COBOL OR PL1 IN THE MAJORITY OF BACKLOG

YES (73.8%)

REASON	% OF TOTAL MENTIONS
CAN REPLACE ONLINE PORTION	24.1
NOTHING IN COBOL IDEAL CAN'T ACCOMPLISH	16.7
NO SPECIFIC REASON	16.7
IS A FULL FUNCTION LANGUAGE	13.0
FLEXIBLE, EASY TO USE	7.4
CAN DO WHOLE PROJECTS	5.6
VERY GOOD EXPERIENCE	5.6
OTHER, SINGLE MENTION	10.9
	100.0%

NO (21.2%)

REASON	% OF TOTAL MENTIONS
BATCH PERFORMANCE	37.2
STILL NEED BOTH	25.6
NEEDS FURTHER REFINEMENT	18.6
NEED COBOL BRIDGE TO CICS	4.7
COBOL BEST FOR BOOLEAN MATH	4.7
OTHER, SINGLE MENTIONS	9.2
	100.0%

- The prime stated replacement barrier for IDEAL is its performance in batch operations. This appears in minority (can't replace) as "batch performance." In the majority positions (can replace) it appears indirectly when respondents allude to IDEAL as replacing COBOL or PL1 for the online portion. Beyond this note that material proportions of respondents indicate that IDEAL is a "full function language" or "nothing in COBOL IDEAL can't accomplish."

- For a significant minority IDEAL has apparently replaced traditional procedural languages. 35.3% of responses in "yes, can replace" specifically indicate an approximation of complete replacement.

- Respondents were additionally asked for a specific quantitative estimate of the percentage of their total applications backlog which they estimated could be written in IDEAL. Seventy-six respondents were able to provide a quantitative estimate. The mean for the group was 70.0%. At the 90% confidence level we are certain that the mean falls between 65.0% and 75.0%.

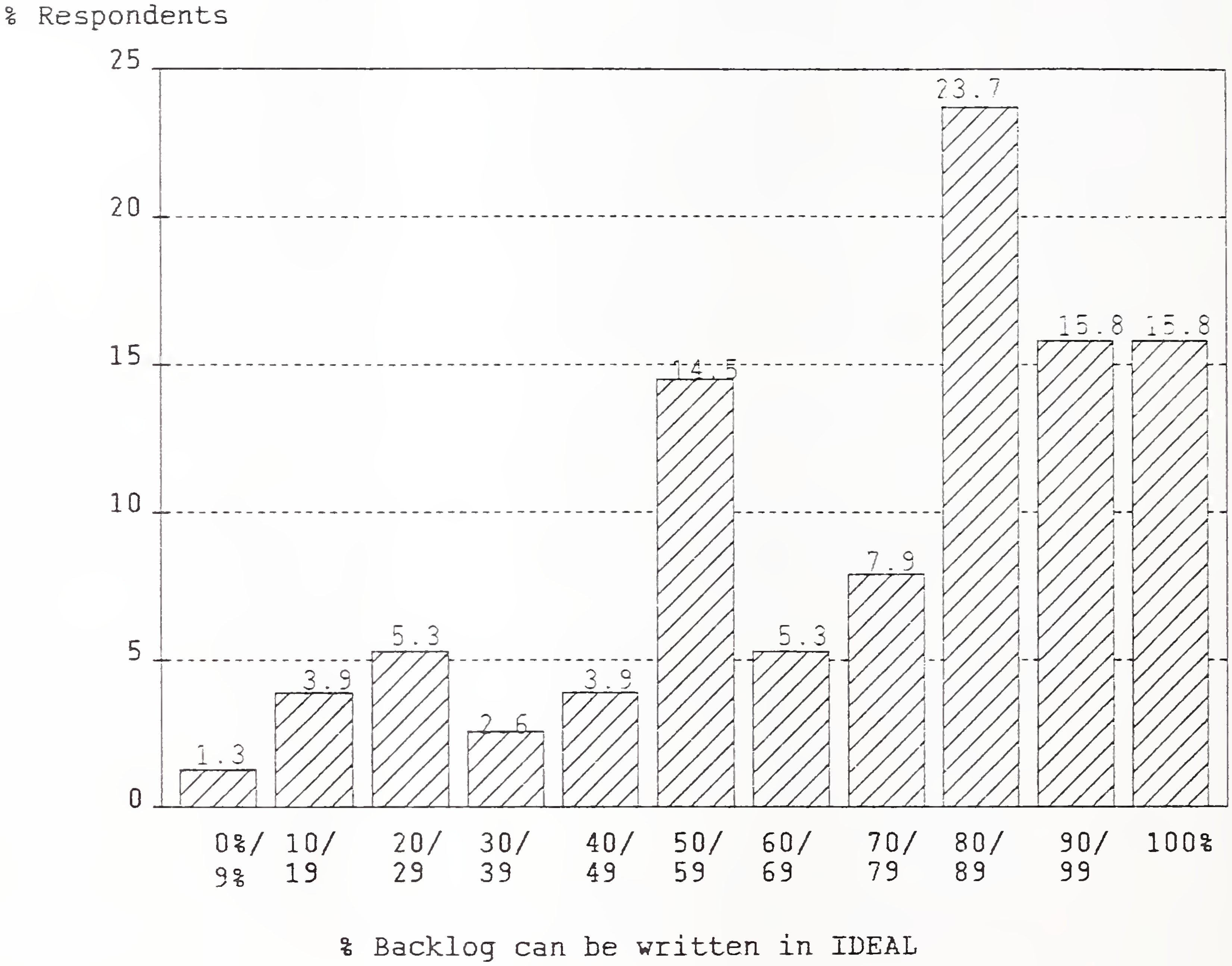
- Exhibit XII presents the distribution of responses in 11 categories beginning at 0-9% and proceeding in steps to 100%. Observe that almost one in four respondents (23.7%) estimated that 80-89% of their applications or program backlog could be written in IDEAL while about one in six felt that 100% of the backlog could be written in IDEAL. About one in six also stated that between 90 and 99% of the backlog was suitable for IDEAL.

- In sum, this data indicates that 55.3% of R's answering this question believed that not less than 80% of the existing backlog could be written in IDEAL.

EXHIBIT XII

BACKLOG SUITABLE FOR IDEAL

Respondent Distribution



N=76

- This data makes clear that a very large proportion of the total backlog is believed by respondents to be suitable for IDEAL implementation. This is verified by not only the mean estimate of 70.0% but by an examination of the distribution of responses.

INCREASE IN PRODUCTIVITY

- Participants were asked to estimate the increase (if any) in productivity as compared to COBOL which they had experienced. The range found was wide with one user claiming no increase in productivity after 18 months involvement and one user claiming a 12:1 increase with 24 months involvement.

- The average productivity increase found versus COBOL was 4.4:1. The 90% confidence interval places the mean productivity increase between 4.1:1 and 4.7:1 among the 65 respondents (81.3%) able to quantify their productivity experience with IDEAL.

- In further examining the distribution it was found that 15.4% of respondents obtained productivity gains of 10:1 or more. About 24.6% experienced gains of 5:1 or more but less than 10:1 while 15.4% achieved gains of 4:1. A total of 55.4% of R's answering the question achieved gains equal to or greater than 4:1. An additional 23.1% of respondents achieved gains of 2:1 or more but less than 4:1.

- In sum, almost eight out of ten experienced at least a doubling of productivity as compared to their prior COBOL experience while almost one in six (15.4%) experienced a productivity gain of ten times or more.

- This indicates that the payback period for an investment in IDEAL is very short (a matter of months) given average productivity increases determined by this research.

- Inspection of the data reveals no pronounced relationship between length of experience with IDEAL nor any obvious relationship between application size or type. While this study is silent on the causes of the increases in productivity over COBOL it is clear that very substantial increases (4:1 or more) are reported by the majority of respondents.

RESPONDENT FREE-FORM COMMENTS

- As a final item in the interview participants were asked if there were any further comments on IDEAL or Fourth Generation Languages in general which they wished to make. Sixty five percent had additional observations and 35% did not.

- Responses were analyzed for common elements and multiple responses are presented as Exhibit XIII.

- Of the multiple mentions on IDEAL, the overwhelming majority are extremely positive. Sixty three percent of IDEAL comments took the form of strong praise for the product. Minor themes were the need for improvement in user education and batch enhancement.

- In the case of general Fourth Generation Language comments the largest group cites high satisfaction with Fourth Generation Language while smaller groups emphasize the need to analyze and understand their use. Another group (representing 4.5% of total comments and 15.8% of general comments) holds the view that no Fourth Generation Language can replace COBOL.

EXHIBIT XIII

FREE-FORM COMMENTS

IDEAL-RELATED (72% OF COMMENTS)

COMMENT	% OF TOTAL TYPE MENTIONS
GOOD PRODUCT WORKS AS ADVERTISED	27.1
ADR A GOOD COMPANY, LISTENS	12.5
ENHANCEMENTS, NEW RELEASES VERY GOOD	12.5
BETTER USER EDUCATION NEEDED	10.4
BATCH ENHANCEMENTS NEEDED	6.3
VERY PLEASED WITH IDEAL	6.3
SAVING MUCH MONEY WITH IDEAL	4.2
OTHER, SINGLE MENTION	20.8
	100.0%

FOURTH GENERATION LANGUAGE GENERAL (28% OF COMMENTS)

COMMENT	% OF TOTAL TYPE MENTIONS
FGL WORKS VERY WELL	36.8
NO FGL CAN REPLACE COBOL	15.8
ANALYSIS NEEDED BEFORE BUYING	15.8
NEED TO UNDERSTAND HUMAN/MACHINE TRADEOFFS	10.5
OTHER, SINGLE MENTION	21.1
	100.0%

- In sum, free-form comments can be said to be highly favorable to IDEAL and Fourth Generation Language in general with some responses as to limitations and cautions in specific circumstances.

V1.2

10/29/85

APPENDIX A

FOURTH GENERATION LANGUAGE QUESTIONNAIRE

Good morning (afternoon). This is ____________ calling from INPUT, an international research and planning firm. We have been commissioned by ADR (Applied Data Research) to conduct a study of users of their IDEAL applications development system. By this time you should have received a letter from Martin Goetz the President of ADR indicating that you have been selected for participation in the study. At the conclusion of the work we will provide you with a summary of the findings so that you may compare your views with others in the IDEAL user community. May we begin? Thank you.

1. To start, we would like to explore some of the reasons you elected to obtain a fourth-generation language for applications development. I will be reading you a list of reasons and will ask you to rate their importance on a scale of one to five (1-5). On this scale "one" is unimportant while "five" is very important.

As a first question, how important on a scale of one to five was the ability to build applications more quickly?

BUILD APPLICATIONS QUICKLY

1 2 3 4 5 DK _____ NA _____ REF _____

2. How important was reduced maintenance on applications?

REDUCED MAINTENANCE

1 2 3 4 5 DK _____ NA _____ REF _____

3. And INCREASED PRODUCTIVITY

1 2 3 4 5 DK _____ NA _____ REF _____

4. How important was your need to complete a specific major project with a pressing deadline?

PRESSING DEADLINE

1 2 3 4 5 DK _____ NA _____ REF _____

5. How important was the desire to reduce your company's applications backlog?

REDUCED BACKLOG

1 2 3 4 5 DK _____ NA _____ REF _____

6. What about ease of use?

EASE OF USE

1 2 3 4 5 DK _____ NA _____ REF _____

7. Were there any factors or reasons we have not covered?

YES_____ NO_____ DK_____ NA_____ REF_____

7a. IF YES: What might these be?

F.1 ______________________________

1 2 3 4 5 DK_____ NA_____ REF_____

F.2 ______________________________

1 2 3 4 5 DK_____ NA_____ REF_____

F.3 ______________________________

1 2 3 4 5 DK_____ NA_____ REF_____

8. How long has IDEAL been used at your location?

MONTHS_______ YEARS_______ DK_____ NA_____ REF_____

9. And how long have you been involved with IDEAL?

MONTHS_______ YEARS_______ DK_____ NA_____ REF_____

10. Were you involved in the decision to acquire and install IDEAL at your current location?

YES_____ NO_____ DK_____ NA_____ REF_____

11. Now we would like to understand something about your familiarity with IDEAL and some other Fourth Generation Languages. On a scale of one to five with one being unfamiliar and five being very familiar, how would you rate your familiarity with IDEAL?

IDEAL 1 2 3 4 5 DK_____ NA_____ REF_____

12. What is your familiarity with SOFTWARE AG's NATURAL?

NATURAL 1 2 3 4 5 DK_____ NA_____ REF_____

13. With Cincom's MANTIS?

MANTIS 1 2 3 4 5 DK_____ NA_____ REF_____

14. With Cullinet's ADS/ONLINE?

ADS/ONLINE 1 2 3 4 5 DK_____ NA_____ REF_____

15. With Information Builder's FOCUS?

FOCUS 1 2 3 4 5 DK_____ NA_____ REF_____

16. Compared to other Fourth Generation Languages with which you are familiar, what was the major reason or reasons for selecting IDEAL? (INT. OBTAIN REASON, IF ANY, FOR ALL EGT4 Q's 12-15. RECORD LANGUAGE AND REASON).

____

____

____

____

____

____

____

____

17. I see. Now turning to the topic of applications, what is the largest application in terms of volume application which has been implemented in IDEAL to date? (INT: GET APPLICATION NAME, ONE OR TWO SENTENCE DESCRIPTION.)

____

____

____

____

18. And what is the second largest volume application in IDEAL? (INT: GET APPLICATION NAME, ONE OR TWO SENTENCE DESCRIPTION.) ______________________________

____

____

____

19. While we don't seek details on them, are there other high volume applications?

YES _____ NO_____ DK_____ NA_____ REF_____

19a. IF YES: About how many? #______________

DK_____ NA_____ REF_____

20. Thinking about these applications, what constitutes high volume at your location in, say, accesses or queries per day or some other measure meaningful to you?

#______________ UNIT______________

DK_____ NA_____ REF_____

20a. On a scale of one to five with "one" being not very satisfactory and "five" being very satisfactory, how would you rate IDEAL's overall performance on these high volume applications?

1 2 3 4 5 DK_____ NA_____ REF_____

21. Now that we have discussed high volume applications, what is the approximate total number of IDEAL applications which have been implemented?

# __________ DK_____ NA_____ REF_____

22. I see. Now about how many new IDEAL applications are currently being written or are planned?

# __________ DK_____ NA_____ REF_____

23. Now based on your experience to date, about what percentage of your total applications or program backlog do you think can be written in IDEAL? __________ % (INT: IF R CANNOT GIVE EXACT ESTIMATE, PROBE FOR RANGE.)

23a. PROMPT: Would you expect that less than 10% could be written in IDEAL? 20%, 50%, 90%?

LT 10%_____ 10-19%_____ 20-29%_____ 30-39%_____ 40-49%_____

50-59%_____ 60-69%_____ 70-79%_____ 80-89%_____ 90-99%_____

100%_____

24. Thinking now in terms of IDEAL's attributes, how would you rate ease of programming using IDEAL with "one" being very hard and "five" being very easy?

1 2 3 4 5 DK_____ NA_____ REF_____

25. On the same scale how would you rate training requirements?

1 2 3 4 5 DK_____ NA_____ REF_____

26. Turning now to effectiveness, how effective do you believe IDEAL to be in prototyping? One is ineffective; five is very effective.

1 2 3 4 5 DK_____ NA_____ REF_____

27. In terms of cost-effectiveness how would you rate IDEAL? One is not very cost-effective; five is very cost-effective?

1 2 3 4 5 DK_____ NA_____ REF_____

28. Are there any other important attributes of IDEAL which we have omitted?

YES_____ NO_____ DK_____ NA_____ REF_____

28a. IF YES: What might these be and how would you rate IDEAL on these attributes with "one" being not satisfactory and "five" being very satisfactory?

A.1 ____________________ 1 2 3 4 5 DK____ NA____ REF___

A.2 ____________________ 1 2 3 4 5 DK____ NA____ REF___

A.3 ____________________ 1 2 3 4 5 DK____ NA____ REF___

29. Considering at this time your overall satisfaction level with IDEAL for the tasks for which you have used it, how would you rate the product? "One" is not satisfactory and "five" is very satisfactory?

1 2 3 4 5 DK_____ NA_____ REF_____

30. Would you be very likely, somewhat likely or unlikely to recommend IDEAL to another data processing professional?

VERY_____ SOMEWHAT_____ UNLIKELY_____

1 2 3 4 5 DK_____ NA_____ REF______

31. Why is this? ____

____

____

____

____

32. What do you believe are IDEAL's greatest strengths?

____

____

32a. What do you believe are IDEAL's greatest weaknesses?

____

____

33. What programmer productivity increase compared to COBOL have you experienced with your use of IDEAL?

No Increase_____ 2:1_____ 5:1_____ 10:1_____ Higher_____
(state value)

Other value (e.g.%)________ DK_____ NA_____ REF_____

34. Based on your experience, do you believe that IDEAL can replace COBOL or PL-1 for the majority of programs in your backlog?

YES_____ NO_____ DK_____ NA_____ REF_____

35. Why is this? ____

____

____

____

____

36. Thank you. Now as a final item, are there any comments or observations about the subject of Fourth Generation Languages in general or about IDEAL in particular that you would like to make?

YES_____ NO_____ DK_____ NA_____ REF_____

36a. IF YES: What might these comments be? ____________________

____

____

____

____

Thank you. On behalf of ADR and INPUT we would like to express our appreciation for sharing your insights and comments with us. You may expect to receive a summary of the study within 90 days. Goodbye.

APPENDIX B

LIST OF ORGANIZATIONS INTERVIEWED (ALPHABETICAL)

Alberta Liquor Control Board

Alberto-Culver Corporation

AMFAC Corporation

Amstar Corporation

Annuity Board of the So. Baptist Conv.

Aqua Chem

Atlanta Gas Light Company

Bank of California

Bell & Howell Company

Bershire Life Insurance

Burgoyne Inc.

Canadian Broadcasting Company

Carolina Power & Light Company

CCA Financial Management Corp.

Central Maine Power Company

Charles of the Ritz Group

Citicorp Financial, Inc.

City of Austin, Information System

City of Charlotte

Cole National Corporation

CONOCO, Inc.

LIST OF ORGANIZATIONS INTERVIEWED (ALPHABETICAL cont'd)

Consolidated Paper

Cordis Corporation

CTB-McGraw Hill Company

Dakota County Government

Dell Publishing Company Inc.

Department of Agriculture

Deseret Medical

Diamond Shamrock Data Services

D.S.T. Systems, Inc.

Duckwall-Alco Stores, Inc.

Durham Life Insurance Company

Durr-Fillauer Medical, Inc.

E.B. Eddy Forest Products

Gancom, Inc.

Grafton-Fraser, Inc.

GTE

Harry & David, Inc.

Hewitt Associates

Hillsborough County School Board

Howard County

Illinois Department of State Police

Independent Life & Accident Inc.

LIST OF ORGANIZATIONS INTERVIEWED (ALPHABETICAL cont'd)

International Minerals & Chemical

Johnson County Data Services

JT Baker Chemical Company

Kentucky Farm Bureau, Insurance

Kimberly Clark Corporation

LaVille DeQuebec

Liggett Group, Inc.

Lowes Corporation

MAPCO Inc.

McGraw Hill

Molex, Inc.

Montana Power Company

Morrison, Incorporated

Nixdorf Computers

Norandal U.S.A., Inc.

Northern Telecom, Inc.

NSERC

Pacific Power & Light Company

PCA International

Public Service Co. of Colorado

PYA Monarch, Inc.

LIST OF ORGANIZATIONS INTERVIEWED (ALPHABETICAL cont'd)

Research-Cottrell
Saga Corporation
Southern Methodist University
Southland Corp.
Southwestern Company
State Bond & Mortgage Corporation
State of Arkansas Dept. of Comp. Services
US Department of Energy
USAF
Venture Stores
Watkins Motor Lines
Washington National Insurance
Worldport L.A.
Yeshiva University

NOTE: Names of two participating organizations have been omitted as a condition of cooperation in this research.

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